

PATENT COOPERATION TREATY
PCT
INTERNATIONAL PRELIMINARY EXAMINATION REPORT
(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 47177	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/IT 03/00417	International filing date (<i>day/month/year</i>) 02.07.2003	Priority date (<i>day/month/year</i>) 09.07.2002
International Patent Classification (IPC) or both national classification and IPC B26D3/16		
Applicant FABIO PERINI S.P.A. et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 6 sheets, including this cover sheet.
 - This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 4 sheets.

3. This report contains indications relating to the following items:
 - I Basis of the opinion
 - II Priority
 - III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - IV Lack of unity of invention
 - V Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
 - VI Certain documents cited
 - VII Certain defects in the international application
 - VIII Certain observations on the international application

Date of submission of the demand 30.01.2004	Date of completion of this report 22.07.2004
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**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/IT 03/00417

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1-14 as originally filed

Claims, Numbers

1-28 received on 28.05.2004 with letter of 17.05.2004

Drawings, Sheets

1/8-8/8 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- the language of publication of the international application (under Rule 48.3(b)).
- the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- contained in the international application in written form.
- filed together with the international application in computer readable form.
- furnished subsequently to this Authority in written form.
- furnished subsequently to this Authority in computer readable form.
- The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- the description, pages:
- the claims, Nos.:
- the drawings, sheets:

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5. This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).
(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

IV. Lack of unity of invention

1. In response to the invitation to restrict or pay additional fees, the applicant has:

restricted the claims.
 paid additional fees.
 paid additional fees under protest.
 neither restricted nor paid additional fees.

2. This Authority found that the requirement of unity of invention is not complied with and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is

complied with.
 not complied with for the following reasons:
see separate sheet

4. Consequently, the following parts of the international application were the subject of international preliminary examination in establishing this report:

all parts.
 the parts relating to claims Nos. 1-8 .

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-8
	No: Claims	
Inventive step (IS)	Yes: Claims	1-8
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-8
	No: Claims	

2. Citations and explanations

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see separate sheet

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

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Re Item IV

Unity of invention

The application lacks unity within the meaning of Article 13 PCT for the following reasons:

The examiner considers that the following separate inventions or groups of inventions are not so linked as to form a single general inventive concept:

- 1.) claims: 1-8: Sharpening unit for a disc-shaped blade.
- 2.) claims: 9-26, 27, 28: Cutting machine for elongated products.

There is no concept linking together the independent claims 1, 9 and 27.

The requisite unity of invention (Rule 13.1 PCT) therefore does not exist inasmuch as a technical relationship involving one or more of the same or corresponding special technical features in the sense of Rule 13.2 PCT does not exist between the subject-matter of the independent claims of the two groups .

In the letter of 17/05/2004 the applicant asked to examine the first group of invention in case the claims are considered to be non-unitary. Therefore an International preliminary Examination Report has been established on the basis of claims 1-8.

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Although the wording is not very clear, the man skilled in the art would understand that the control component is sliding axially in a support around its own axis, coinciding with the axis of rotation of the grinding wheel and that a angular movement of this control component would result in a axial translation along said axis. The following examination has been carried out based on such an understanding.

Reference is made to the following documents:

D1: US-A- 4 041 813

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

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Document D1, which is considered to represent the most relevant state of the art, discloses a sharpening unit for a rotating disk-shaped blade from which the subject-matter of claim 1 differs in that it comprises a control component sliding axially in a support and moving axially around its own axis, whereby an angular movement is translated into an axial movement that is transmitted to the grinding wheel.

The subject-matter of claim 1 is therefore new (Article 33(2) PCT).

The problem to be solved by the present invention may be regarded as to find a way to control the position of the grinding wheels relative to the cutting edges of the disk-shaped blades.

The solution to this problem proposed in claim 1 of the present application is considered as involving an inventive step (Article 33(3) PCT) for the following reasons:

None of the available prior art documents disclose or fairly suggest to use control elements that translate angular movements around its own axis in translatory movements along said axis. D1 proposes cylinders and a lever system but does not mention the solution of claim 1. US-A-5 152 105 discloses a control element that translates angular movements into translations but the element is not slidable axially so that the produced translation is different to that defined in claim 1. WO 01/36151 proposes axial movement of the grinding wheel but the control element is acting as a hydraulic piston and so does not translate angular movement into translation.

Claims 2-8 are dependent on claim 1. and as such also meet the requirements of the PCT with respect to novelty and inventive step.

The subject matter of claims 1- 8 is, without any doubt, industrially applicable, Art. 33(4) PCT.

Amendment under Art. 34PCT

(99)

New Claims

1. A sharpening unit (80) for a rotating disk-shaped blade comprising at least one sharpening grinding wheel (81) and a control component sliding axially in a support (93) and moving angularly around its own axis (C-C), means (103, 105, 106) being provided to control the angular movement of said control component in the support, an axial movement of the control component, which transmits said motion to said grinding wheel, corresponding to said angular movement.
- 10 2. Sharpening unit (80) as claimed in claim 1, characterized in that: said control component comprises a bushing (89) sliding axially in said support (93) and moving angularly around its own axis (C-C); said grinding wheel is supported coaxially to said bushing; and means (103, 105, 106) are provided to control the angular movement of the bushing in the support, an axial movement of the bushing and therefore of the grinding wheel corresponding to said angular movement.
- 15 3. Sharpening unit as claimed in claim 1 or 2, characterized in that a cam mechanism (103, 105) is disposed between the support and said control component to produce axial translation of the control component when it is made to rotate around its own axis.
- 20 4. Sharpening unit as claimed in claim 3, characterized in that an actuator (109), which controls the rotatory movement of the control component around its own axis, is associated with said control component.
- 25 5. Sharpening unit as claimed in claim 4, characterized in that said actuator is a piston-cylinder actuator.
6. Sharpening unit as claimed in one or more of the claims from 1 to 5, characterized by means to control the contact pressure between the grinding wheel and the disk-shaped blade.
- 30 7. Sharpening unit as claimed in claims 5 and 6, characterized in that said means to control the contact pressure comprise means to control the operating pressure of the fluid to operate said piston-cylinder actuator.
8. Cutting machine for cutting elongated products (L), comprising a disk-shaped blade and a sharpening unit according to one or more of the

preceding claims.

9. Cutting machine for cutting elongated products (L), comprising: at least one path for the products to be cut (L); at least one device (3, 5, 9) for feeding the products along said path, according to a direction of feed (fL); an element (17) rotating around a main axis of rotation (A-A); on said rotating element, at least one disk-shaped blade (19A, 19B, 19C) rotating around its own axis of rotation (B-B), said blade being provided with alternate translatory motion, substantially parallel to the direction of feed; characterized in that the disk-shaped blade moves axially in relation to the rotating element during rotation of said rotating element, and in that the translatory movement of the disk-shaped blade is controlled so that it moves in the same direction as the direction of feed of the products to be cut when the blade is engaged in said products to follow the feed of the products during cutting, motion in the opposite direction to the direction of feed of the products being imparted on said blade in a period of time in which the blade is disengaged from said products.

10. Cutting machine as claimed in claim 9, characterized in that said main axis of rotation (A-A) of the rotating element (17) and said axis of rotation (B-B) of the disk-shaped blade are substantially parallel to each other and to the direction of feed of the products to be cut (L).

11. Cutting machine as claimed in claim 9 or 10, characterized in that at least two and preferably three rotating disk-shaped blades are carried on said rotating element.

12. Cutting machine as claimed in one or more of claims 9 to 11, characterized in that each of said disk-shaped blades is carried by a sleeve (59A, 59B, 59C) sliding axially in a corresponding seat (63A, 63B, 63C) of the rotating element (17).

13. Cutting machine as claimed in claim 12, characterized in that a sharpening unit (80) of the respective disk-shaped blade is integral with each of said sleeves, said sharpening unit translating with an alternate motion integral with the corresponding disk-shaped blade.

14. Cutting machine as claimed in one or more of claims 9 to 13, characterized in that each of said blades (19A, 19B, 19C) is operated in its

alternate motion by a common cam component (71; 125).

15. Cutting machine as claimed in claim 14, characterized in that a feeler (67A, 67B, 67C), cooperating directly with said common cam (71), is associated with each of said blades.

5 16. Cutting machine as claimed in claim 14, characterized in that said common cam (125) transmits movement to the sleeves (59A, 59B, 59C) via respective rocker components (121A, 121B, 121C) supported by said rotating element (17).

17. Cutting machine as claimed in one or more of the claims from 12 to
10 16, characterized in that each of said sleeves is provided with anti-rotation means (58, 60) which prevent rotation but allow translation of the sleeve around its axis in relation to the rotating element.

18. Cutting machine as claimed in at least claim 13, characterized in that each of said sharpening units comprises at least one grinding wheel (81, 83)
15 that moves from an operating position, in contact with the cutting edge of the respective disk-shaped blade, to a position in which it is not operating, out of contact with said disk-shaped blade.

19. Cutting machine as claimed in at least claim 13, characterized in that each of said sharpening units comprises two grinding wheels (81, 83) for
20 sharpening the two sides of the cutting edge of the respective blade (19A, 19B, 19C).

20. Cutting machine as claimed in claim 19, characterized in that said two grinding wheels each move from a respective operating position, in contact with a respective side of the cutting edge of the respective disk-shaped blade, to a respective position in which it is not operating, out of contact with said disk-shaped blade.

21. Cutting machine as claimed in claim 20, characterized in that said movement to move the grinding wheel or wheels towards or away from the cutting blade is parallel to the axis of the grinding wheel or wheels.

30 22. Cutting machine as claimed in one or more of the claims from 18 to 21, characterized in that each grinding wheel is carried by a bushing (89) sliding axially in a support (93) integral with the sleeve (59A, 59B, 59C) of the respective blade (19A, 19B, 19C).

23. Cutting machine as claimed in claim 22, characterized in that said bushing (89) moves angularly around its own axis (C-C) coinciding with the axis of rotation of the grinding wheel.

24. Cutting machine as claimed in claim 23, characterized in that a cam mechanism (103, 105), which produces axial translation of the bushing when said bushing is made to rotate around its own axis, is disposed between said support (93) and the bushing (89).

25. Cutting machine as claimed in one or more of the claims from 22 to 24, characterized in that an actuator (109), which controls the rotary movement of the bushing around its own axis, is associated with each of said bushings.

26. Cutting machine as claimed in at least claim 22, characterized in that said bushing has a helical groove (103) in which a small wheel (105) integral with said support (93) engages.

27. Cutting machine for cutting elongated products (L), comprising: at least one path for the products to be cut (L); at least one device (3, 5, 9) for feeding the products along said path, according to a direction of feed (f_L); an element (17) rotating around a main axis of rotation (A-A); on said rotating element, at least one disk-shaped blade (19A, 19B, 19C) rotating around its own axis of rotation (B-B), said blade being provided with alternate translatory motion parallel to its own axis during rotation of said rotating element, substantially parallel to the direction of feed (); characterized in that each of said blades (19A, 19B, 19C) is operated in its alternate motion by a common cam component (71; 125).

28. Machine as claimed in claim 27, characterized in that said common cam component is substantially fixed.